

REMARKS

Claims 1 - 81 are pending in the above-identified application. Claims 1 - 11 and 46 - 53 are withdrawn from consideration.

In the Office Action of July 17, 2003, Claims 12 - 45 and 54 - 81 were rejected. No claim was allowed. In response, Claims 13 - 18, 25 - 45 and 54 - 81 are canceled without prejudice or disclaimer, Claims 12 and 19 - 24 are amended and new Claims 82 - 86 are added to the application. Reexamination and reconsideration are respectfully requested in view of the foregoing amendments and the following remarks.

Submission of new Form 1449

The Examiner alleged that the Form 1449 submitted with the application was incomplete because the Thomas publication [AU] lacks a year of publication. In response, a new PTO 1449 is submitted supplying this information.

Rejection of Claims 12 - 45 and 54 - 81 under 35 U.S.C. §112, second paragraph

Claims 12 - 45 and 54 - 81 were rejected under 35 U.S.C. §112, second paragraph, as being indefinite.

Regarding Claims 12 and 28, the Examiner alleges that it is unclear whether the microbe that catalyzes the 13-hydroxylation is a different or may be the same microbe that performs the β -oxidation and that the claims may be interpreted to use the same species of organism for the first and second organism. Further, the

Examiner alleges that there is no antecedent basis for the recitation of "the first" and "the second" microorganisms in these claims. In response, Claims 12 and 28 are amended to clarify that the microorganism that catalyzes the 13-hydroxylation is different from the microbe that performs the β -oxidation.

Regarding Claims 12, 13, 25, 26, 28, 29, 41, 42, 64, 65, 77 and 78, the Examiner alleges that these claims contain improper parenthetical inclusions. In response, the parenthetical phrases are deleted from Claims 12 and 28, the remainder of the claims mentioned in this rejection having been canceled.

Accordingly, it is respectfully submitted that the rejections under 35 U.S.C. §112, second paragraph, for indefiniteness are thereby overcome.

Rejection of Claims 20, 24, 36, 40, 59, 63, 72 and 76 under 35 U.S.C. §112, first paragraph

Claims 20, 24, 36, 40, 59, 63, 72 and 76 were rejected under 35 U.S.C. §112, first paragraph. The Examiner notes that some of the claims require access to a specific organism and states it must be shown that the organism is obtainable by a repeatable method or is readily available to the public.

Claims 36, 40, 59, 63, 72 and 76 are canceled. The rejection is respectfully traversed as it may be applied to Claims 20 and 24 as amended herein. 37 C.F.R. 1.802 states that a deposit of a biological material is not required if the material is known and readily available to the public. It is respectfully submitted that all of the microorganisms recited in claims 20 and 24 are known and are commercially available from public depositories. (Commercial availability could not be confirmed for "Pediococcus sp. IFO 3778", so this organism has been deleted from the claims.)

Accordingly, withdrawal of the rejection under 35 U.S.C. §112, first paragraph, is respectfully requested.

Rejection of Claims 12 - 17, 21 - 25, 27 - 33, 37 - 41, 43 - 45, 54 - 56, and 67 - 69 under 35 U.S.C. §103(a) over Endrizzi in combination with Hudson or Fox

Claims 12 - 17, 21 - 25, 27 - 33, 37 - 41, 43 - 45, 54 - 56 and 67 - 69 are rejected under 35 USC 103(a) as obvious over Endrizzi et al, "Production of Lactones and Peroxisomal Beta-Oxidation in Yeasts", Critical Reviews in Biotechnology, 16(4), pgs 301 - 329, 1996, in combination with Hudson et al "Hydration of linoleic acid by bacteria isolated from ruminants" FEMS Microbiology Letters 169: 277 - 282 (1998) or Fox et al ("The biosynthesis of oxylipins of linoleic and arachidonic acids by the sewage fungus *Leptomitus lacteus*, including the identification of 8 R-hydroxy-9Z, 12Z-octadecadienoic acid", Lipids 35 (1): 23 - 30 (2000). The Office Action alleges that Hudson discloses that *Enterococcus fecalis* and *Streptococcus bovis* convert linoleic acid to 13-hydroxy-9-octadecenoic acid and that Fox discloses that *Leptomitus lacteus* convert linoleic acid to 13-hydroxy-octadecenoic acid. The Examiner further alleges that Endrizzi discloses that β -oxidation of fatty acids with the hydroxyl group on an odd carbon is possible and that yeast such as from the genera *Candida*, *Pichia*, *Hansenula* and others possess a peroxisomal system that performs this reaction. The Examiner alleges that the substitution of a 13-hydroxy-octadecenoic acid in Hudson or Fox that produce a 13-hydroxy-octadecenoic acid by use of *E. fecalis* or *S. bovis* or *L. lacteus* from linoleic as a substrate to produce delta lactone by *Saccharomyces cerevisiae* or

Kluveromyces lactis or *Pichia etchellsii* or a yeast from the genus

Zygosaccharomyces would have been obvious. The Examiner alleges that Endrizzi teaches that yeast can perform beta oxidation on hydroxylated fatty acids, which beta oxidized fatty acids are taught by Endrizzi to form lactones.

Claims 13 - 18, 25 - 45 and 54 - 81 are canceled. The rejection is traversed as it may apply to Claims 12, 21 - 24, and new Claims 82 - 86.

Amended independent Claim 12 relates to a process for producing δ -decalactone, which comprises the steps of (i) causing cells or a culture of a microorganism belonging to the genus *Pediococcus* or *Bifidobacterium*, or a treated matter thereof, to act on linoleic acid or a composition containing linoleic acid to form 13-hydroxy-9-octadecenoic acid and (ii) causing cells or a culture of a microorganism belonging to the genus *Kluyveromyces*, *Zygosaccharomyces*, *Pichia*, *Saccharomyces*, or a treated matter thereof, to act on the formed 13-hydroxy-9-octadecenoic acid and (iii) recovering the formed δ -decalactone.

New independent Claim 82 relates to a process for producing jasmine lactone, which comprises the steps of (i) causing cells or a culture of a microorganism belonging to the genus *Pediococcus* or *Bifidobacterium*, or a treated matter thereof, to act on α -linolenic acid or a composition containing α -linolenic acid to form 13-hydroxy-9, 15-octadecadienoic acid and (ii) causing cells or a culture of a microorganism belonging to the genus *Kluyveromyces*, *Zygosaccharomyces*, *Pichia*, *Saccharomyces*, or a treated matter thereof, to act on the formed 13-hydroxy-9, 15-octadecadienoic acid and (iii) recovering the formed jasmine lactone.

Hudson discloses that *Enterococcus faecalis* and *Streptococcus bovis* convert

linoleic acid to 13-hydroxy-9-octadecenoic acid. Fox discloses that *Leptomit* *lacteus* convert linoleic acid to 13-hydroxy-octadecamonoenoic acid. However, the references neither teach nor suggest that a microorganism belonging to the genus *Pediococcus* or *Bifidobacterium* converts linoleic acid to 13-hydroxy-9-octadecenoic acid. Further, the references neither teach nor suggest that a microorganism belonging to the genus *Pediococcus* or *Bifidobacterium* converts α -linolenic acid to 13-hydroxy-9, 15-octadecadienoic acid.

On page 304, right column and in Table 1, Endrizzi discloses that δ -decalactone can be formed from 11-hydroxypalmitic acid and δ -octalactone can be formed from 3, 11-dihydroxymyristic acid by yeasts such as *Saccharomyces cerevisiae* or *Zygosaccharomyces fermentati*. However, the reference neither teaches nor suggests that δ -decalactone can be formed from 13-hydroxy-9-octadecenoic acid by a microorganism belonging to the genus *Kluyveromyces*, *Zygosaccharomyces*, *Pichia*, or *Saccharomyces*. Further, the reference neither teaches nor suggests that jasmine lactone can be formed from 13-hydroxy-9,15-octadecadienoic acid by a microorganism belonging to the genus *Kluyveromyces*, *Zygosaccharomyces*, *Pichia*, or *Saccharomyces*.

The Examiner alleges that Endrizzi teaches that yeast can perform beta oxidation on hydroxylated fatty acids, which beta oxidized fatty acids and particular species of yeasts are specifically taught by Endrizzi to form delta lactones. However, it is respectfully submitted that that particular species of yeasts that can perform beta oxidation on one hydroxylated fatty acid, cannot always perform beta oxidation on another hydroxylated fatty acid. For example, although the yeast

belonging to the genus *Kluyveromyces*, *Zygosaccharomyces*, *Pichia*, or *Saccharomyces*, which is claimed in claims 12 and 82, can perform beta oxidation on 13-hydroxy-9-octadecenoic acid and 13-hydroxy-9, 15-octadecadienoic acid as described above, the yeast can not perform beta oxidation on 13-hydroxy-6, 9-octadecadienoic acid [see page 3 in the present specification, formula (I)]. In other words, no delta lactone can be formed from 13-hydroxy-6, 9-octadecadienoic acid by the yeast belonging to the genus *Kluyveromyces*, *Zygosaccharomyces*, *Pichia*, or *Saccharomyces*.

Accordingly, it is respectfully submitted that the combination of the cited references does not teach or suggest a process of Claims 12, 19 - 24 and 82 - 86 for producing δ -decalactone and jasmine lactone respectively from 13-hydroxy-9-octadecenoic acid and 13-hydroxy-9, 15-octadecadienoic acid formed respectively from linoleic acid and α -linoleic acid by the activity of microorganisms.

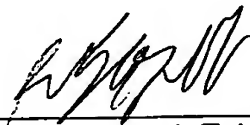
Conclusion

In view of the foregoing amendments and remarks, it is respectfully submitted that Claims 12, 19 - 24, and 82 - 86 are in condition for allowance. Favorable reconsideration is respectfully requested.

Should the Examiner believe that anything further is necessary to place this application in condition for allowance, the Examiner is requested to contact applicants' undersigned attorney at the telephone number listed below.

Kindly charge any additional fees due, or credit overpayment of fees, to
Deposit Account No. 01-2135 (123.12345X00).

Respectfully submitted,
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Attachment: corrected form PTO 1449